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## THE NET VOLUME OF SAVING IN THE UNITED STATES MEASURED BY THE INCREASE IN THE TOTAL WEALTH OF THE COUNTRY <sup>1</sup>

BY WILLFORD I. KING, *National Bureau of Economic Research*

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### PART I

#### A. INTRODUCTION

From time to time, various economists and financial writers have presented estimates of the extent of saving in the United States. In most of these cases the term "saving" has not been carefully defined. If the word had only one commonly accepted meaning, this omission might be a matter of but slight moment; but, as a matter of fact, the term is used in a number of different senses which are but slightly related to one another. In most instances, however, the statement of the purposes of the investigation enables a reader who is himself familiar with the various usages of the word to select the particular definition of saving which is applicable. A perusal of their writings will show that some investigators have sought to ascertain the relative thriftiness of different classes of the population. Others have been interested in the actual or potential supply of loanable funds. Some have sought to ascertain the adequacy of the provisions made to meet periods of adversity. Still others have desired to measure the increase in the wealth of the nation.

It is to be feared that some writers on the subject have not only failed to define the term "saving" in a formal way but have sometimes included in their aggregate of "savings" items that do not logically belong in the category under discussion. In order to avoid falling into a similar pitfall it seems highly desirable, in undertaking a new study,

<sup>1</sup> Acknowledgment is hereby made to the National Bureau of Economic Research for its grant of all the facilities necessary for the making of this study.

to discuss the various types of saving and to set rather precise limits to the field which is to be covered. Such a procedure is attempted in the pages which immediately follow.

## B. THE MEANING OF THE TERM "NET SAVINGS"

Accumulation Versus Retention of Assets.—Saving may be thought of either as the accumulation or the retention of assets. Thus we say that by careful economy a man has saved a competence from his earnings, meaning of course that he has accumulated wealth little by little; but we also say that one man has saved his inheritance while another has squandered what was left to him by his parents. In this latter usage there is evidently involved no thought of accumulation but only the idea of successful retention of assets. This use of the term "saving" as synonymous with the retention of wealth has been emphasized by many economists in connection with the effect of waiting and abstinence upon the interest rate. When, however, one speaks of the volume of saving in a country, the reference is invariably to the accumulation and not to the retention of assets, and it is the rate of this accumulation which statisticians frequently attempt to measure. The discussion which follows will deal exclusively with saving defined as a process of accumulation.

Does Saving Connote Effort or Sacrifice?—Popular usage often associates the term "saving" with effort and sacrifice. Thus it is felt that the workman who toils arduously and uses only a small fraction of his earnings for the purchase of consumption goods is necessarily a great saver. If, however, he invests these earnings in "wild cat" securities or loses them at the gambling table, he is nothing ahead at the close of the year. If his procedure constitutes saving, it is certainly not of the type that can be dealt with successfully by the accountant or the statistician; they find it most practical to define net saving as an increase in net assets<sup>1</sup> between any two given dates.

Net Saving Defined.—From this point of view, *net savings are additions to the stock of consumption goods or increases in the power to produce or acquire income which have arisen through the acquisition of property or through investments in education.*<sup>2</sup> This definition is the one which accords with the purposes of this investigation.

Saving May Be Fortuitous.—According to this definition, saving may involve no effort on the part of the saver, for net assets often increase through purely fortuitous circumstances. Since, however, such gains might readily be used for the purchase of consumption goods,

<sup>1</sup> "Net assets" in accounting parlance means the total value of property owned less total indebtedness.

<sup>2</sup> It is impracticable to measure statistically gains in the form of investments in education.

there seems no reason for excluding from the category of savings such gains as may be retained to the end of the period under consideration.

**The Nature of the Objects Saved.**—Any complete analysis of saving must deal not only with the process but also with the nature of the objects saved. Saving presumably began with the accumulation of stores of consumption goods. Early in the history of the human race, however, saving began to take the form of improvement in the equipment used in getting a living. Today we convert our efforts into railways, buildings, machines, tools, and other devices which enable us to utilize more easily the resources and forces furnished us by nature. Some of the most expensive and important forms of saving are not tangible but consist of such things as accumulated scientific knowledge and the training of the human mind. Savings of the last-mentioned variety are extremely perishable, since they are constantly being lost through the death of the persons possessing the education. Accumulated scientific knowledge is, on the other hand, the most durable form of savings. Although it is true that new discoveries and the introduction of new processes do frequently diminish or nullify the value of certain kinds of knowledge, it nevertheless seems highly probable that the proportionate loss in this field is far less than that which occurs in the case of buildings, machines, and the like.

### C. AN ANALYSIS OF THE PROBLEM OF MEASURING THE SAVINGS OF THE NATION

**The Savings of the People of the Nation.**—Saving may be considered not only in connection with the nature of the objects saved but also as regards the persons or groups who save or who are the beneficiaries of the saving. Thus, we may, for instance, study saving from the national point of view. A nation's savings during any period evidently are comprised of increases in:

- (1) The stock of wealth in the form of material goods used either for production or for consumption by the government or by the inhabitants. This evidently includes improvements in the land itself as well as additions to the stock of buildings and of movable goods.
- (2) Valuable claims<sup>1</sup> against other nations or their inhabitants.
- (3) The accumulated store of scientific knowledge.
- (4) The productive power of the individual inhabitants resulting from education, hygienic measures, etc.

<sup>1</sup> These claims are evidences of equities in a stock of tangible goods located abroad which either have been produced or are expected to be produced.

The Effect on National Saving of the Diminution in Free Goods and in Natural Resources.—The fact should not be overlooked that the net increase in the stock of material wealth (free goods plus economic goods) is likely to be distinctly less in amount than the increase in the stock of economic goods; for while the quantity of machines, buildings, and similar improvements has been rapidly increasing in most civilized countries, there has been at the same time a decided diminution in the aggregate of the undeveloped resources of the nation. In the United States, for example, there no longer exist the once great areas of fertile land awaiting the plow or the vast forests of virgin timber which formerly covered much of the country, and our mineral resources likewise have been largely exploited.

It is necessary to remember also that in the realm of economic goods the loss of soil fertility and the depletion of our mines goes far to offset the increase taking place in the quantities of goods produced by the aid of man's efforts. Allowance for such deterioration is always necessary before any accurate picture of national saving can be obtained.

It is, however, doubtless true that the loss in natural resources has been offset to no inconsiderable degree by the bringing into use of new land which, under the conditions prevailing at an earlier period, had little or no utility to mankind. Furthermore, science has given great utility to natural resources which were formerly wholly useless. That this factor is not of negligible importance is made evident when we remember that two centuries ago anthracite coal was believed to be fit only for ballast, that no means had been invented for utilizing more than an infinitesimal fraction of the available water power, and that rubber was deemed useful merely for pencil erasers. These are only a few of the many similar examples which might be cited.

Although the changes which have occurred in the inventory of natural resources are very real they are also extremely difficult to measure with any reasonable degree of accuracy, and the problem of calculating the national savings is greatly complicated by this fact.

Saving by Governments.—National saving differs radically from governmental saving. The latter is usually referred to as public saving. Governments accumulate:

- (1) Public buildings, parks, canals, roads, vessels, machinery, etc.
- (2) Money or credits—in other words, valuable claims against private persons or other governments.
- (3) Improvements in the administrative system and organization.

Private Saving.—Private saving is much more akin to governmental than to national saving. Private saving is carried on both by individ-

uals and by business units. At the present time the larger business units are principally organized in the corporate form, while the smaller businesses are conducted mainly by individuals. In the latter case it is often impossible to distinguish the savings of the business from the personal savings of its owner. Private savings consist of:

- (1) Increases in stocks of consumers' goods (direct goods).
- (2) Improvements in business equipment.
- (3) Improvements in business organization.
- (4) Increases in holdings of money and credits—that is, in holdings of valuable claims against governments or other business enterprises or persons.
- (5) Acquisitions of stock or part ownership in other business enterprises.
- (6) Improvements in acquisitive power due to educational or hygienic measures.

Money and credits (the fourth in the list of private savings) are often given especial prominence by writers on the subject of saving because this form of savings is commonly used for one of two purposes, both of which are of great importance in their effect upon business activity. Money and credits are commonly either exchanged for other goods (thus affecting market prices), or are loaned to entrepreneurs in order that they in turn may either obtain commodities needed in their business or gain control of other enterprises (thus affecting interest rates).

**Savings Affected by Changes in the Price Level.**—In the computation of savings in terms of money value, it is of course imperative to eliminate at the start all changes in values resulting from variations in the price level. The price indexes obtainable may themselves be so erroneous that this single necessary correction will in itself be sufficient to prevent estimates of most classes of savings from attaining any high degree of accuracy. This, however, is only one of several obstacles tending to hinder the statistician who undertakes inquiries in this field.

**The Volume of Private Saving is Not Necessarily Gaged by the Value of New Securities Floated.**—The assumption is frequently made that the extent of saving in a country can be measured by the volume of funds offered for investment in notes, bonds, mortgages, or similar securities. It is true that a large part of such loanable funds consists of amounts set aside from current income for investment purposes. However, it is also true that when business men are optimistic concerning the business outlook they desire to invest most of their free funds in

entrepreneurial undertakings, but when they become pessimistic they curtail the extent of their operations and become desirous of loaning not only part of their current income but also money accumulated through reduction of inventories.

It is true, however, as is shown in Part II of this article, that in years when business profits are large the sales of bonds likewise are generally above normal. This increase in bond sales presumably represents principally a rise in the curve representing the demand for loans rather than an increase in the supply of loanable funds offered at a given interest rate, for it is a well-known fact that in boom times interest rates rise sharply. It appears, therefore, that the supply of loanable funds offered at any given interest rate may be a poor criterion of the extent of private saving in the country. This lack of direct relationship, however, does not preclude the fact that variations in the actual sales of bonds may be a rather good gage of changes in the volume of private saving in general. But, even though bond sales measure roughly fluctuations in the volume of private saving, it is evident that since private savings may represent no accessions to the national wealth, bond sales are not necessarily good criteria of the accumulations made by the nation as a whole.

Some Types of Saving Not Measurable.—It is extremely difficult if not entirely impracticable to measure statistically savings embodied in human beings. The statistical part of this study will therefore be confined wholly to those savings external to the people themselves. But, owing to the paucity of available data, it is far from possible to measure all the types of external saving concerning which there may be a widespread interest. Although it is, for example, as stated above, perfectly feasible to ascertain the approximate amounts invested each year in certain types of securities, it seems entirely impracticable to estimate another related quantity, namely, the potential supply of loanable funds. In attempting the computation of this quantity, certain students seem to have made the assumption that the aggregate volume of private saving in the nation is a more or less immutable quantity which cannot be changed materially but which can only be shifted from one field to another. There seems to be little ground for accepting the validity of this hypothesis. As a matter of fact, the extent of private saving seems to vary greatly with different phases of the business cycle, and it appears highly probable that in time of great national emergency the people of the United States might save treble the average amount laid aside in normal times. In fact, the only limit upon possible saving is that enough of the net personal income remain for consumption to supply the population with the barest necessities,

and this minimum would doubtless require considerably less than half the total income of a prosperous nation like the United States. The measurement of the potential supply of loanable funds evidently involves the determination of a supply curve at each date; for manifestly the supply offered would vary according to the rate of interest. Since there is every reason to believe that there are wide variations in the conditions affecting both the demand for and the supply of loanable funds, it appears to be extremely difficult if not impossible to derive for this field either supply or demand curves which can lay any claim to even approximate accuracy.

Net Private Saving Very Different from Gross Private Saving.—In dealing with the question of savings, it is well to remember that one can gain no adequate idea of the volume of national saving by adding together gross private savings of various kinds, the reason being that these gross private savings are so largely offset by losses, wastes, and expenditures for consumption goods, and that the net amounts remaining are often relatively trivial. For example, very many millions of dollars of savings are invested each year in enterprises which fail, and these savings are thereby dissipated. Billions were saved by the American people and invested in Liberty Bonds, but the proceeds were used to purchase war supplies, and hence the country is now little if any richer because of the saving. The savings of the working classes are largely utilized to cover the expenses of vacation outings, weddings, and funerals. Such uses evidently lead to no increase in the nation's wealth. It follows that the volume of gross private saving does not necessarily bear any fixed ratio to the volume of net private saving remaining after all deductions have been made; hence the former cannot be regarded as an accurate criterion by which to measure the latter.

If, however, it were possible to ascertain for any given interval of time the net savings of the various individuals in the country, and if these net amounts were summated and their aggregate added to the net savings of all governmental units during the same period, the total would represent the quantity most sought in this study, namely, the net national saving for the period.

Measurable Types of Saving.—Owing to the numerous difficulties involved in the statistical measurement of savings it is the part of wisdom for the statistician to confine his efforts to measuring those few types of saving for which fairly satisfactory data are available. Even in these few cases the margin of error is likely to be large. However, it is probably true that mere approximations may prove to be of considerable value. In some instances in which absolute measurements are impracticable, it is still perfectly possible to obtain figures which



show the relative fluctuations in the volume of accumulation, and these figures throw light on certain economic problems.

The following outline shows the relationship to each other of some of the numerous types of saving in the United States. These types have been selected because they seem to be both susceptible of rough statistical measurement and also of sufficient general interest to warrant an effort to compute their volume.

- I. First, classification of the annual increase in the entire wealth of the nation.
  - A. The increase in the net value of claims against foreign nations.
    1. Private claims.
    2. Claims of the United States Government.
  - B. The annual increase in the internal wealth of the United States.
- II. Second classification of the annual increase in the entire wealth of the nation.
  - A. The increase in the value of claims of the federal government against foreign nations.
  - B. The increase in the value of the other assets of governmental units. (These assets can be estimated only in a very rough way.)
  - C. The volume of business savings. (This estimate must be based mainly upon the reports of savings by corporations.)
  - D. The net amounts saved by the people from their personal incomes. (This quantity can be calculated only roughly by subtracting estimated business savings from the estimates of total private savings.)

It is therefore to the measurement of these selected items that the statistical studies which follow are directed.

The Use of Money Values in the Measurement of Savings is Unavoidable.—In the calculation of the amount of saving we are primarily interested in the increase in the utility of the stock of goods on hand and not in the increase in their money value. The direct measurement of the total utility of the nation's stock of goods is, however, practically impossible. We are driven, therefore, to the indirect method of using money value as an intermediary through which we must pass in order to arrive at a measure intended to indicate for different years the relative income commanding power of the stock of wealth on hand. As a first step in this direction it appears necessary to estimate the current valuations placed each year upon the internal wealth of the nation.

If values are to be used in a measurement of wealth which in turn is to be taken as a basis for computing savings, the question arises as to whether we shall base our estimates upon the values of property rights represented, for example, by stocks, bonds, and paper money, or whether we shall confine ourselves to a study of the values of physical wealth only. The former method is more direct and is at least as accurate in principle as the latter. The practical reason for confining our studies to valuations of physical wealth is that while the census reports profess to cover this form completely they furnish us but little

information concerning the value of property rights. Since the census gives us our only broad base, we have, then, little choice as to the procedure to be followed. As a matter of fact, it seems reasonable to suppose that the net value of all property rights is approximately equal to the net value of the physical wealth upon which those property rights are based.

We must not lose sight of the fact, however, that when wealth is expressed in terms of value, the value is a measure of property rights and not of a quantity of physical objects or of an amount of utility.

In Measuring Savings all Property Values must be Treated Alike.—Since we have defined national saving as being equivalent to the sum of private and governmental saving, and since either of these kinds of saving is measured by the increase in net worth between two dates, there is evidently no distinction whatever to be made between the values of different types of property. It is, therefore, wholly immaterial whether the property value is based upon land or other national resources, upon buildings or equipment, or upon consumption goods. In any case, if the price level has not changed, every gain in net worth is to be counted as saving.

The General Plan of Attacking the Problem.—In order to measure the total savings of the people of the nation, the most feasible procedure seems to be to take the following successive steps:

1. Measure the total wealth as expressed in dollars of the current year.
2. Find what the wealth in each year would have been worth if the price level had remained the same as in 1913.
3. Ascertain the increase during the entire period in this wealth measured in unchanging dollars.
4. Apportion this increase as accurately as possible between the different years of the period.

In order to understand the nature of changes in wealth it seems necessary first to analyze rather carefully the principles which determine the valuation of indirect goods.

#### D. THE PRINCIPLES OF VALUATION AND THEIR RELATIONSHIP TO THE VALUE OF WEALTH AS REPORTED BY THE CENSUS BUREAU

How Indirect Goods Are Valued.—A large part of the economic wealth of the people of the United States consists of real estate, transportation systems, and machinery—all typical examples of durable indirect or production goods. Such goods derive their value wholly from the anticipated values of the future services which they are ex-

pected to render or of the products to which it is anticipated they will give rise. Each owner or prospective purchaser who is interested in these goods from the standpoint of income discounts the values of these various future products or services at his own subjective interest rate and adds the resulting amounts together to arrive at a total which represents the present subjective value of the goods in question to the given individual. A dealer or speculator, however, may have no direct interest in the services which the goods are expected to render, for, if an owner, he hopes to sell the goods soon; if a prospective purchaser, he intends to buy merely in the hope of making an early sale at a quick profit. His subjective price, therefore, represents not discounted income payments but merely his anticipated selling price discounted to the present date at his subjective interest rate. In times of active speculation both buyers and sellers sometimes almost entirely lose sight of the income expected from the goods; but such a condition of affairs is usually quite transitory. Prices based upon the present worth of anticipated services are the forces which in the long run are dominant.

The subjective prices of all interested persons whether speculators, dealers, or investors, impinge upon each other in the market, and in this way a price is determined at which exchanges of some units actually occur. This market price is then commonly imputed by the statistician to all units existing under like conditions. Statisticians add together the estimated values thus arrived at to obtain estimates of the total value of a given kind of wealth.

**Value of National Wealth Fluctuates with Every Change in Public Opinion.**—The above analysis indicates that the value of wealth in a country at any given date is fundamentally dependent upon the subjective valuations placed upon the various items by persons owning or dealing therein. Anything that changes these subjective valuations must then necessarily affect the total value of the wealth of the country. Each person in fixing his subjective value for any article is influenced primarily by two factors: first, his belief as to the value of the service or product at the date at which he expects it to be disposed of; second, his present subjective rate of discount for future values.

It follows, therefore, that whenever most of the interested parties change their opinions as to the future selling price of the products, the present value of indirect goods at once changes. This is easily illustrated by the value of a share of stock. If it is the current opinion that the stock in the future is likely to earn on the average 5 per cent per annum, the stock may sell for \$40 per share; but if for any reason

whatever—perhaps only because of an entirely baseless rumor—most of the persons owning or desiring to purchase the stock are suddenly convinced that it will probably earn, for an indefinite period, an average of 10 per cent, the value of the stock will quickly increase to the neighborhood of \$80 per share. Similarly a change in opinion as to the prospective level of railway rates will affect the value of railway systems, and an increase in optimism on the part of steel manufacturers will enhance the value of steel works.

A change in opinion concerning interest rates is no less important in affecting subjective and market values than is a change in beliefs concerning prospective selling values. When a man who has been estimating that money is worth 4 per cent to him suddenly decides that it is instead worth 6 per cent, the present worth to him of every item of future income, and hence of durable goods in general, evidently drops off sharply. If others generally change their views in the same way, the resulting fall in subjective values tends quickly to lower market values.

From what has just been said, it follows that the value of the economic wealth of the country really fluctuates up and down, not in proportion to changes in the average prices of consumption goods, but rather in consonance with waves of feeling regarding interest rates or pertaining to anticipated future prices.

Statistics of Wealth Values Commonly Represent Trends rather than Current Values.—Such oscillations, however, are likely to be smoothed out to a considerable extent in statistical reports of aggregate wealth, for these reports are often based upon inventory valuations as carried upon the books of business concerns, and these “book values” are commonly more closely connected with costs or with records of financial transactions than with actual present values. This point must be kept in mind in dealing with statistics of wealth as commonly presented. The United States Census of Wealth should, for this reason, be regarded as recording rather an approximation to the trend of total values than the actual sum of the market values at a given date.

Saving is Better Measured by the Trend than by a Record of Actual Values.—In measuring the savings accruing during a given period, it evidently is necessary to adjust the inventories at the beginning and at the end of the period to allow for changes in the purchasing power of money. It appears also from the preceding line of reasoning that, if possible, adjustments should be made to counteract variations in values due to shifts in the public psychology in the direction of optimism or pessimism; for it seems rather absurd to say that the nation

has suddenly saved fifty billions of dollars because the interest rate has fallen or because a wave of optimism has just swept over the country. Yet such causes might easily produce such a change of values in the course of a few months. In practice, however, it is most difficult to make corrections to offset price level changes. Presumably, one of the best methods of eliminating those changes in the value of property arising merely from transitory changes in public opinion is to read the desired values at the various required dates rather from a smooth trend than from the actual values prevailing at the various dates. Since, in practice, the data are commonly too inaccurate to permit of more than a rough approximation to the truth, it is unnecessary to devote much energy to refining the methods of treatment. It is nevertheless desirable that the ideal sought should be visualized as clearly as possible.

The Census Bureau's Estimate of the Value of the Wealth of the United States.—Having considered the principles determining the valuation of durable goods, let us now see how these principles affect estimates of wealth such as have been made from time to time by the United States Census Bureau. A large part of the wealth of the United States consists of lands, buildings, factories, furniture, automobiles, clothing, and other articles which change hands only occasionally. This condition is especially characteristic of publicly owned real estate, such as canals, parks, and public buildings. Rarely, indeed, are land, buildings, and factories standardized commodities. An article included in any of the types mentioned above may either have deteriorated greatly or may have been greatly improved since the date of its last transfer. The price level may also have shifted much during the interval. Interest rates may have changed greatly. Under these circumstances, it is altogether probable that subjective values will, as a rule, have either risen or fallen materially, and, if so, the price at which the goods would sell if placed on the present market might differ radically from that paid for it when it was last sold. The present owner can, at best, measure accurately only the change in his own subjective value and can merely guess at the price which the article would bring if placed on the market; and yet his guess is likely to be better than that of most other persons. An actual enumeration of the valuations representing the unbiased opinions of the owners of property would be subject to some error, though it might be that the principle of compensation would so operate as to make the error of the total small.

The Census authorities have, however, not thus far attempted any such enumeration. In the case of the most important class of property,

real estate, they have depended mainly upon valuations placed thereupon by tax assessors, and these of course are likely to vary widely from the truth. Since, in most localities, assessed values are lower than market values, it has been incumbent upon the Census authorities to multiply the total assessed value in each locality by a factor which it is supposed will give the true market value as a product. The ascertainment of the correct multiplying factor is obviously no simple task. When we consider the weaknesses of this method, it is no reflection upon the efficiency of the Census Bureau to say that its valuations of the real estate of the country represent only approximations to the facts. Yet there seems reason to believe that the Census Bureau's valuations of real estate are more accurate than are those made for some other classes of property. It appears, therefore, that the census totals must be regarded merely as rough approximations to the value of the physical wealth of the country. Nevertheless, since they are the only figures available, it is necessary to use these estimates as the basing points for any study of wealth in the United States.

#### E. AN ESTIMATE OF THE CURRENT VALUATIONS PLACED UPON THE WEALTH OF THE UNITED STATES FOR THE YEARS 1909 TO 1919

The last estimate by the Census Bureau of the wealth of the country was made for the early part of 1912. For our purposes it is desirable to obtain a figure representing the value of the physical wealth of the country at the beginning of each year since 1909. The method followed in estimating the valuations placed each year upon the total internal wealth of the nation has been to assume the 1912 census figures for each category to be correct and to vary the figures for each kind of wealth in the other years since 1909 in proportion to the changes in an index number believed to represent the variations in the current value of that particular type of property. One advantage of this method is that the errors in the estimates of the different types of wealth are likely to compensate each other to some extent, thus reducing the error of the aggregate of all kinds of wealth. Fortunately, also, the nature of the available data makes this method of attack more feasible and convenient than any other. This mode of procedure necessitates the computation for each of the census categories of a corresponding appropriate index, the fluctuations of which are then assumed to be proportional to these categories in the value of that form of wealth. The manner of deriving the indexes for the respective fields is briefly indicated in the paragraphs that follow.

Real Estate.—Real estate has, for purposes of this study, been

divided into three categories, namely, urban real estate, farm lands, and farm buildings. The method used in estimating the value of farm lands involves the assumption that farm acreage increased at a constant rate between 1910 and 1920. The total value for each year is computed by multiplying the acreage calculated according to this premise by the average land value in that year. This average land value has been estimated by combining the reports of the Census and the estimates of the Department of Agriculture, as recorded in the *Monthly Crop Reporter*.

The assumption followed in calculating the value of farm buildings is that these buildings have increased steadily in physical quantity and that the value of each building has varied from year to year in proportion to the rent index prepared by the United States Bureau of Labor Statistics. By use of a composite index based upon these two assumptions, values have been interpolated for the intercensal years—that is, between the 1910 and the 1920 census estimates.

The total value of agricultural real estate in 1912 has been estimated in the manner just described, and this total has been subtracted from the total value of real estate as reported by the Census Bureau. Although the remainder represents mainly urban real estate, an appreciable fraction thereof consists of mining<sup>1</sup> and other property situated in rural regions. However, these amounts are scarcely large enough to vitiate seriously the results obtained by using as an index the value of urban real estate as shown by the city tax departments for the various years of the decade.

The reports of the Census Bureau entitled *Financial Statistics of Cities* purport to show the assessed value of real estate and the ratio of the assessed value to the true value in each city of considerable size for more than half of the years of the decade. The supposed true value of the real estate in each city has been computed therefrom by division. The usefulness of these figures as criteria of realty values is distinctly lessened by the fact that apparently little care has been taken by the Census authorities to enter the assessment reports under the year to which they actually apply. Fortunately, direct city reports are available for the larger cities (which virtually dominate the totals), and data from these have been largely substituted for the amounts appearing in the *Financial Statistics of Cities* as basic materials for our index. In the case of the smaller cities it has been necessary to utilize the census figures as they stand. Any error arising from this source is not likely to be important for the reason that the course of the total

<sup>1</sup> Walter R. Ingalls, in Chapter IV of his *Wealth and Income of the American People*, estimates the value of the mines in 1916 as \$3,880,000,000. This would represent about 5 per cent of all non-agricultural real estate.

of city realty values has been steadily upward throughout the period, and, with a slope so nearly constant, a slight shifting of the curve from left to right is not a matter of great moment, as it will have a negligible effect on the final results. The estimated value of urban real estate in 1912, multiplied by the indexes for the various years, gives the estimated total value of urban realty for each year of the decade.

**Live Stock and Farm Implements and Machinery.**—The 1912 census valuations for the above named types of farm property have been assumed to vary respectively in proportion to the estimates of the values of the same items made by the National Bureau of Economic Research in connection with its studies of agricultural income in the United States.

**Gold and Silver Coin and Bullion.**—The value of the stock of precious metals recorded by the Census Bureau for 1912 has been assumed to vary in proportion to the estimates of the stock of gold and silver money in the United States as shown in the reports of the Comptroller of the Currency.

**Manufacturing Machinery, Tools, etc.**—No adequate criterion of the changes in the amount of this category of wealth seems to be available. Under the circumstances it has been assumed to vary in proportion to the reported capital of manufacturing concerns. The possible error of this method is further increased by the fact that estimates for capital are available only for the census years 1909, 1914, and 1919, and therefore amounts for intervening years must be obtained by interpolation. In this case a smoothed curve has been used as the medium for accomplishing this end. The quantities arrived at, therefore, although probably far from accurate, may nevertheless serve to indicate the general trend in the amount of this type of wealth.

**Railroads and Their Equipment.**—The first impulse would lead one to turn to the physical valuation of railways by the Interstate Commerce Commission as a guide to their total value. A little reflection, however, shows that this physical valuation is intended only to measure some form of cost, and may show nothing about present value which depends entirely upon estimates of future earning power. It may well happen that owing to rate regulation, for example, the market value of the railways may have declined although both the investment in railway enterprises and the physical quantity of every kind of railway property may have increased during the same period. Such a contingency leads one to inquire whether the use of the total market value of railway securities may not give rise to serious errors in the aggregate estimate of wealth. A little consideration, however, leads one to see that the specified state of affairs furnishes no ground for



suspicion; for while the reduction of railway rates forces down the value of railway property, it enhances to an equal extent the value of the property of the shippers. The correctness of the total of all wealth is then in no way vitiated.

The most logical measure of the value of the railways of the United States seems, then, to be the total value of their outstanding securities. Fortunately, the Interstate Commerce Commission reports for each year the par value of railway bonds outstanding and also the face value of stocks paying dividends and of those not paying dividends. The value of the latter class has been assumed to be one fourth as much per share as the value of the first class, and the two classes of stocks have been combined on this basis. The total for each year has been multiplied by the index of railway stock prices published by the Harvard Committee on Economic Research. Similarly the total face value of railway bonds outstanding for each year has been divided by the average yield on such bonds<sup>1</sup> to attain an index of bond values. The stock and bond indexes have, after appropriate weighting, been combined, and the combined index has been used as a criterion by which to measure changes in the total value of the railways of the United States in each year. While this index is doubtless not highly exact, it does not seem probable that it is seriously erroneous in any year.

Public Service Enterprises.—The ideal method of measuring the variations in the value of such concerns would be to follow the procedure just outlined in the case of railways. However, no summary of the capital and bond issues of such enterprises has been discovered. Under the circumstances, the very doubtful assumption has been made that the values of these properties have varied in proportion to the respective total income returns for the preceding years on all property invested in this field. The relative stability of corporate income in this field prevents the conclusions reached from being as erroneous as would be the case in most other lines of industry were this method applied thereto.

Agricultural Products.—It has been assumed that the value of agricultural products on hand January first has varied in proportion to the total value of such commodities produced in the preceding year. The validity of this assumption is of course lessened by the fact that the amount of crops and live stock held over and the rapidity of export vary from year to year. On the whole, however, it appears that this criterion is sufficiently accurate for most purposes.

Manufactured Products.—The stock of manufactured goods on hand at the first of the year has likewise been assumed to vary in pro-

<sup>1</sup> Also reported by the Harvard Committee on Economic Research.

portion to the gross output of the factories during the preceding year. Presumably the net output for the last half of the year would be the ideal criterion, but figures therefor are not available.

Imported Merchandise.—It seems that the value of the stock of imported merchandise on hand January first ought to be about proportional to the volume of imports for the fiscal year ending the succeeding June thirtieth. The estimates here stated have been computed according to that premise.

Mining Products.—The total value of mineral production for the preceding year, as recorded by the United States Geological Survey, is apparently the best available gage of the probable stock of mining products on hand at the first of the next calendar year. The estimates here presented have been made according to this assumption.

Automobiles.—In the study of the automobile repair industry,<sup>1</sup> an estimate was made of the total cost of replacing with new cars of the same type all cars in use at the first of each year. Of course they are, as a rule, not new but partly worn out. It has been assumed that their present value is 60 per cent of their value were they new. This item has therefore been added directly to the estimate of the value of the other kinds of wealth in the nation.

Clothing, Personal Ornaments, Furniture, Carriages, etc.—Since no satisfactory variable representing this group has been discovered, the assumption has been made that the value of the entire stock of consumption goods other than automobiles varies in proportion to the total value of all other physical wealth in the country.

The Current Valuation Placed on all Physical Wealth in the Nation.—The aggregate of the current valuations of the physical wealth in the United States has been computed by the simple process of adding together for each year the items above listed. To the quantity thus obtained, it is evidently necessary to add the net amount of American holdings and credits abroad in order to arrive at the total value placed upon the property of the United States and its people.

Net Holdings in and Claims against Foreign Countries.—In view of the relatively slight importance of this item, the very rough nature of the estimates of the values placed upon other types of wealth, and the existence of a very good study along this line made by Professor John H. Williams and Mr. Frank Vanderlip, it has not seemed worth while to make an independent investigation of the extent to which this country and its citizens are indebted to or have claims against foreign people or nations. The study just referred to is published in the *Harvard Review of Economic Statistics*. While the data are not presented

<sup>1</sup> Made in connection with the estimate of income in the United States.

TABLE I  
THE ESTIMATED<sup>1</sup> VALUE AT THE BEGINNING OF THE YEAR OF THE INTERNAL WEALTH AND FOREIGN HOLDINGS OF THE GOVERNMENT  
AND PEOPLE OF THE UNITED STATES, MEASURED IN PRICES CURRENT IN THE SPECIFIED YEARS  
(Millions of Dollars)

Beginning of year	Urban realty and mines	Farm realty	Live stock	Farm imple- ments and machinery	Agricultural products	Gold and silver coin and bullion	Railroads and their equipments	Public service plants and equipments	Mining products
1909.....	\$64,432	\$33,849	\$5,724	\$1,021	\$5,091	\$2,441	\$14,637	\$8,777	\$675
1910.....	66,096	34,801	6,203	1,111	5,083	2,455	15,564	9,331	799
1911.....	73,274	34,289	6,382	1,348	5,722	2,514	15,791	10,599	843
1912.....	77,644	36,232	6,735	1,368	5,240	2,617	16,149	10,265	816
1913.....	77,010	36,092	7,137	1,446	5,340	2,686	16,144	11,164	950
1914.....	80,011	36,095	7,137	1,445	5,957	2,730	15,390	11,319	1,034
1915.....	81,845	40,530	7,152	1,457	6,768	2,795	14,585	10,978	897
1916.....	82,726	43,327	7,158	1,637	8,497	3,090	15,682	12,524	1,014
1917.....	84,447	48,347	7,800	2,081	8,491	3,534	15,921	14,524	1,485
1918.....	86,649	52,950	9,593	2,680	10,183	3,946	15,853	14,069	2,114
1919.....	87,801	53,900	9,986	2,907	13,242	3,538	12,830	11,767	2,346

  

Beginning of year	Manufacturing machinery, tools, etc.	Manufactured products	Imported merchandise	Automobiles	Clothing, per- sonal ornaments, furniture, etc.	Total internal physical wealth	Property rights in foreign countries	Total current valuation of wealth
1909.....	\$5,037	\$11,107	\$623	\$301	\$10,552	\$164,241	\$-1,637	\$162,604
1910.....	5,366	14,261	754	431	11,167	173,822	-1,997	172,125
1911.....	5,727	15,018	757	587	11,931	185,701	-1,757	183,044
1912.....	6,091	14,694	827	697	12,062	187,739	-1,917	185,822
1913.....	6,377	16,591	906	731	12,662	197,077	-1,877	195,200
1914.....	6,557	17,805	983	768	13,055	203,208	-1,937	201,271
1915.....	6,636	16,796	863	1,026	13,133	204,430	-1,372	203,048
1916.....	7,020	19,613	1,186	1,200	14,021	218,233	+338	218,571
1917.....	8,389	30,064	1,442	1,200	15,656	243,684	+2,455	246,139
1918.....	10,366	39,377	1,602	2,484	17,140	266,783	+5,364	272,147
1919.....	12,002	43,461	1,719	4,380	18,278	284,498	+9,647	294,145

<sup>1</sup> For mode of estimation, see the text.

<sup>2</sup> The figures for this year are taken from the U. S. Census of Wealth, Debt, and Taxation.

in such a manner as to make it easy to separate out exactly the material desired, the study mentioned furnishes sufficient information to make it possible to approximate the totals sought. The material in the *Review* has been supplemented somewhat by figures derived from Mr. Walter R. Ingalls' recent book on the *Wealth and Income of the American People*. It is well to note the fact that Dr. B. M. Anderson's estimates<sup>1</sup> would indicate for the post-war years the existence of unfunded claims against European debtors much larger in amount than those shown by the Harvard studies. Since, however, many of these claims are of doubtful value, it seems wise to base our figures upon the lower rather than upon the higher estimates.

Table I shows that the valuation placed by the American people upon the physical wealth within the country has increased during each year of the decade. The rate of increase has varied, however, being much larger for the years since 1915 than it was for previous years. This more rapid increase presumably means that because of the increase in current prices people generally believed that the money-income from a typical piece of property would in the future be larger than it had been in the past.

The last column of the table shows that the inclusion of claims against foreign countries makes the nominal increase since 1916 in the value of the total wealth much greater than the increase in the value of the physical wealth alone. The present worth of these claims against foreign nations is at present, however, probably less than their face value because of the fear that payment may be defaulted when the amounts come due.

*(To be concluded.)*

<sup>1</sup> Published in the bulletins of the Chase National Bank.